

UNCLASSIFIED

AD NUMBER

AD492042

CLASSIFICATION CHANGES

TO: **unclassified**

FROM: **confidential**

LIMITATION CHANGES

TO:

**Approved for public release, distribution
unlimited**

FROM:

**Distribution authorized to U.S. Gov't.
agencies and their contractors;
Administrative/Operational Use; 08 DEC
1948. Other requests shall be referred to
Springfield Armory [Army], Springfield,
MA.**

AUTHORITY

**USAWC ltr, 13 Jul 1972; USAWC ltr, 13 Jul
1972**

THIS PAGE IS UNCLASSIFIED

UNCLASSIFIED

AD. 492 042

DEFENSE DOCUMENTATION CENTER
FOR
SCIENTIFIC AND TECHNICAL INFORMATION

CAMERON STATION ALEXANDRIA, VIRGINIA



UNCLASSIFIED

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

UNANNOUNCED

UNCLASSIFIED

491042 X1150

SPRINGFIELD ARMORY

RESEARCH AND DEVELOPMENT



D D C
DRAFTED
JUL 16 1966
SA-2103

MEMORANDUM REPORT

PROJECT TITLE AMMUNITION, CALIBER .30

FOR LIGHT WEIGHT WEAPONS

PROJECT NO. TS 1 - 2

REPORT TITLE ROUND-ROBIN COMPARISON
TEST OF LIGHT RIFLE AMMUNITION CALIBER .30

SPRINGFIELD, MASSACHUSETTS

ITEM. .30 AMM. DATE 8 DEC 1948 SA-MR20-2103

Springfield Armory

DECLASSIFIED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS
DOD DIR 5200.10

UNCLASSIFIED

SPRINGFIELD ARMORY
RESEARCH AND DEVELOPMENT DIVISION
MEMORANDUM REPORT SA-MR20-2103

UNCLASSIFIED

L. O. Spaulding/shp/632

8 December 1948

SUBJECT:

Round-Robin Comparison Test of Light Rifle Ammunition Caliber .30

OBJECT:

To obtain a record of the pressure and velocity of the subject ammunition to be used to determine the testing level of this station.

SUMMARY:

Ten rounds each of the subject ammunition were fired for velocity and pressure. Average chamber pressure was 33,795 p.s.i., average port pressure was 17,020 p.s.i. and the average of individual velocities was 2534 f.s. Detailed information is shown on Tables I and II.

REFERENCE:

F.A. 474/552
S.A. 471.41/24

MATERIAL:

1. Duplex Pressure Gage, Serial Number 3330172. Mann barrel 22 inches long. Rifling one turn in twelve inches. Originally chambered according to drawing SPOTS 150 and later reamed to accommodate the modified light rifle cartridge T65E1. Chamber pressure opening .925 inches from rear of barrel and port pressure opening 12.445 inches from rear of barrel. Headspace 1.5485 inches.

2. Light Rifle, Caliber .30 Model T-28 Number 10 for velocities.

3. Counter Chronograph in conjunction with lumiline screens manufactured by "CODE PO". Instrumental velocity at 53 feet.

4. Barograph manufactured by "CODE FD"

~~CONFIDENTIAL~~

~~UNCLASSIFIED~~

5. Thermograph manufactured by "CORE FD".
6. Light Rifle Ammunition, Caliber .30 T65E1 submitted for test by Frankford Arsenal. (no lot number given)
7. Coppers for obtaining chamber pressures
Mean length uncompressed .4002
Mean diameter uncompressed .2264
For use with 1/30 square inch diameter piston.
Frankford Arsenal Drawing No. F.D. 12963 dated 12/11/43
S. O. 462 Lot 3
E. D. Memo 112 F. Y. 43
8. Coppers for obtaining port pressures
Mean length uncompressed .4001
Mean diameter uncompressed .1462
For use with 1/30 square inch diameter piston.
Frankford Arsenal Drawing No. F.D. 12977 dated 12/29/43
S. O. 583 Lot 1A
E. D. Memo 112 F. Y. 43

DATE OF TEST:

30 November 1948.

PROCEDURE:

Ten rounds of the subject ammunition were fired in a duplex gage for chamber and port pressures.

As an M2 Universal Receiver was not available, ten single round velocities (I.V. at 53 ft.) were obtained with the use of a Lightweight Rifle, Caliber .30, T-28 having a comparatively new barrel and 1.5485 headspace.

Method of conducting test was done in accordance with procedure outlined in ORD-M608-PM Section 7-13.

The firing of reference rounds immediately after firing the test rounds was omitted due to unavailability of reference rounds of this type ammunition.

RESULTS:

The average chamber pressure for ten rounds was 13795 pounds per square inch.

The average port pressure for ten rounds was 17020 pounds per square inch.

-5-

~~CONFIDENTIAL~~
~~UNCLASSIFIED~~

CONFIDENTIAL

Average check velocity at 53 feet taken with pressures for nine rounds (one round, no record) was 2427 feet per second.

Average velocity for ten rounds at 53 feet taken with the Lightweight Rifle Caliber .30, T28 was 2534 feet per second.

Detailed pressure and velocity information is shown on Tables I and III.

PREPARED BY

J. O. Spaulding
J. O. SPAULDING
Ordnance Engineer

REVIEWED BY

H. F. Hawthorne
H. F. HAWTHORNE
Ordnance Engineer

CONCUR

E. W. Hopkins
E. W. HOPKINS
Head Ordnance Engineer

APPROVED

F. J. McMorrow
F. J. McMORROW
Lt Col, Ord Dept

CONFIDENTIAL

TABLE I

CHAMBER AND PORT PRESSURE CHECK
ON
LIGHT RIFLE AMMUNITION SUBMITTED
BY FRANKFORD ARSENAL

CHAMBER PRESSURE LBS. PER SQ. IN.	PORT PRESSURE LBS. PER SQ. IN.	CHECK VELOCITY FT. PER SEC. AT 53 FT.			
33950	16500	2419			
33900	16500	2431			
33600	16800				
35100+	16500	2432			
33150	17900	2436			
33200	17300	2418			
32950	16500-	2410-			
34550	16900	2436			
32950	17400	2426			
32600-	17900+	2438+			
Mean	33795	Mean	17020	Mean	2427
Max.	35100	Max.	17900	Max.	2438
Min.	32600	Min.	16500	Min.	2410
Ex. Var.	2500	Ex. Var.	1400	Ex. Var.	28
S.D.	678	S. D.	540	S.D.	15.7

Firing room temperature 74° F.

Barometer 30.1 inches

Duplex Pressure Gage #3330172

Counter chronograph and lumiline screens

CONFIDENTIAL
TABLE II

INSTRUMENTAL VELOCITY AT 53 FEET
OF LIGHT RIFLE AMMUNITION
SUBMITTED BY FRANKFORD ARSENAL

VELOCITY AT 53 FEET
FT PER SECOND

2539
2469-
2578+
2545
2520
2511
2514
2534
2568
2562

Mean	2534
Max.	2578
Min.	2469
Ex. Var.	109
S.D.	30.6

Firing room temperature 74° F.
Barometer 30.1 inches
Counter chronograph and lumiline screens
Lightweight Rifle Caliber .30, T28, #10

CONFIDENTIAL